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THE ANALYSIS OF APPLICATION OF TIME SERIES TO COMMERIAL PROPERTY INVESTMENT IN LAFIA METROPOLIS

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Abstract

The importance of predicting real property investment returns cannot be over emphasized. However, due to the dearth of relevant information and knowledge with regard to real property investment in Nigeria despite the huge investments there-in, predicting property investment returns has not been feasible in Lafia in particular and Nigeria in general. The study adopted the survey research design and questionnaire was the main source of data collection. The study revealed that Estate Surveyors and Valuers can adopt the time series model in predicting future rental returns on real property investments thereby improving their service delivery to their clients. The aim of the study is to study the accommodation in Lafia metropolis, and employ them in making future projections on commercial properties in the study area. The need to choose the period was based on the need and quest for commercial properties after the global economic recession.

Introduction

Real Estate investment has become the most popular mode of investment in Nigeria, while institutional investors prefer to invest in real property (considering the rate of return on real property) particularly in the commercial sector due to the expected high rate of returns (Ekenta, 2007). According to Kalu (2001) return is a measure of the success or otherwise of investment. Real property by nature is a peculiar type of investment whose market has distinct features from other goods and services traded in the conventional markets. this poses serious difficult in the investigation concerning the return on property investments and their future tendencies.

Due to paucity of relevant information and knowledge with regard to real properties in Nigeria despite the huge investments there-in, forecasting of the states of return thereof has not been feasible in Nigeria (Ekenta, 2007). This readily brings to limelight the unfortunate predicament of real property investment in the Nigerian property market, where investors do not receive guidance or assistance based on scientific analysis and projections of expected returns on comparable investment alternative.

The importance of a well-informed decision making process based on a standard quantitative forecast technique in the economic development of individual property investors in particular and the society at large can hardly be over emphasized. This is because without such forecast techniques, investors will not be properly guided in making sound investment decision that would enhance economic growth. Developed economies such as the United States of America and the United Kingdom rode to exalted economic and technological heights on the back of wise investments.

In every investment (both financial and real property) capital is normally parted with in expectation of a return. When the investment is made by the operation of the enabling activities, the return may vary, being either higher or lower than expected. This variation is usually forecasted by the financial assets analyst through the analysis and application of some quantitative techniques. Based on this premised Olaleye (2004) in his study reported that in Nigeria, property portfolio managers adopt traditional management technique because better active portfolio management practice which depends on maintenance of a comprehensive database is lacking in the industry. Aluko (1998) posited that data is the driving force that fuel Investment analysis, but collection of representative data given a clear indication of market activity is greatly hampered. Aluko (1998)

maintained the market cannot be analyzed meaningfully without accurate information. The need to choose the period was based on the need and quest for commercial properties after the global economic recession.

Study Area

Lafia is the capital city of Nasarawa state. It is also the state's largest city with a population of 330,712 inhabitants according to the 2006 census results. Lafia is formerly referred to as Lafia Beri-Beri it shares boundaries with Nasarawa Eggon and Wamba Local Government areas in the North, Obi Local Government in the SouthEast, Doma LGA in the South West, Kokona LGA in the West and Plateau State in the East respectively. It has an average maximum and minimum temperatures of about 26^0c and 30^0c respectively and annual rainfall of about 1,120mm- 1,500mm relative humidity of 60-80% and falls within the Guinea Savannah kind of vegetation (Meteorological Dept. 2012). Worthy of note is that due to increase in demand for commercial activities in the study area, there has been series of conversations of some residential properties to commercial use.

Literature

Time series

A time series is a sequence of observation of data points measured over a time interval Cai et al. (2015). Nsude (2005) define it has the chronological arrangement of the values of the variable that are available for several past period of time. Time series are plotted via line charts or scatter plots where time, the independent variable on which we have low or no control, is in X axis and the data points are plotted on Y axis.

Components of Time Series

In the words of Nsude (2005) time series are classified into four components, namely

i. Secular Trend (T); this is the basic tendency of a data to grow upward or decline downward during a long period of time.

ii. Seasonal variation (S); This is the movement in time series, which repeats themselves periodically every season.

iii. Cyclical Variations (C); this is the recurrent variation whose movement is more than one year.

iv. Irregular variation (I); this is the variation that is mixed up with seasonal and cyclical variations.

Uses of the time series analysis

The various uses of the analysis of time series among others include; the following according to Ajayi (1998).

(i) To determine the impact of the various forces influencing different variables and their comparisons.

(ii) To study the past behavior of variables in order to enable the prediction of their future tendencies.

(iii) It reveals the past behaviors of the variables.

(iv) It allows a good knowledge of the behavior of variable hence enables us to solve the problem of intra-year variations.

Commercial Property

Commercial property refers to land and buildings intended to generate a profit either from rental income or capital appreciation. According to Ekenta (2015), commercial properties are those properties that are connected with buying and selling of goods and services for the purpose of marketing profit.

This class of property investment comprises shops (ranging from local shops to shopping malls and supermarket/emporia, office blocks, warehouses and show rooms (Ekenta, 2007). Other includes stores, restaurants, hotels, petrol filling stations and motor parks.

Real Property Investment

Real property investment is distinct from financial investment. Real property investment involve the creation of new income yielding assets from land and its resources based on capital analysis of expected cost risk and benefits within a given time (udoudoh, 2016). Real property investments are class of investment that offers security of capital and income in real terms. Whatever the nature of investment, a rational investor seeks to maximize his returns while minimizing the risk undertaken as has already been stated.

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Return Rental Value

According to (Igwe-Kalu & Akpan,2019) return is a performance measure used to evaluate the efficiency of an investment. It is the benefit of an investment expressed as a percentage or ratio

Income Return (R) = Net Rental income x 100

Capital income of property 1

Real value is the fair market value of property while rented out in a lease. Real value is monetary return which may reasonably be expected to be obtained from letting a property in the open market at a particularly point in time (Ekenta, 2010). By open market here, we mean that all the parties must be aware of the rent property will command in the market. More generally , it may be the consideration paid under the lease for the right lesser under a license to real property. The rent payment could be weekly, monthly quarterly or yearly depending on the terms and conditions of tenancy.

Determinants of Rental value

The major determinants of rental value of commercial properties are:

(a) Location: proximity and accessibility of properties to various amenities such as waste sites, public transportation, etc will increase the demand as well as the rental value.

(b) Quality of Construction: A property that is constructed with high quality and expensive material will attract high demand.

(c) Availability of Amenities: it is well known fact that every prospective tenant will be require basic amenities provided in the property he/she will be paying for and for such not to be provided the tenant should be ready and willing to pay for the provision of such.

(d) Neighborhood characteristics:The socio-economic characteristics of neighboring structures to a large extent determine rental values.

(e) Environmental attributes of the building: if the noise and pollution level are high there is every tendency that prospective tenants will be unwilling to state in such neighborhood

(g) Size of the building: properties with enough space will definitely be in high demand compared to properties that has lesser space.

Forecasting

Forecasting can be defined as attempt to predict the future by using qualitative or quantitative means. It is an integral part of all human activity, From the business point of view ,the increasing attention is being given to formal forecasting systems which are continually being refined. Every form of decision making and planning activities in business adopts forecasting (Adeniran et al. 2018).

According to lyneis (200), forecasting is inevitable in the process of decision making. He focused on market forecasting and used it in designing model of aircraft industry. The aim of forecasting is predicting the future under certain situations. Forecasting is different from planning. Planning concerns what the world should look like, while forecasting is about what it will look (Armstrong, (2001.)

Paulas (2012) was of the view that decision makers use forecasting to predict the result of different plans and revise their plans to get a satisfactory result.

In general, there are two forecasting methods, quantitative and qualitative. Quantitative forecast uses the historic data. The main types of quantitative forecasting are time series analysis and regression analysis. Qualitative forecast itself relies on the subjective opinion and in tuition of experts in the field. An example of qualitative forecasting technique is the Delphi method which is recommended mostly for problems that require qualitative answers rather than quantitative results. Based on the analysis by the researcher it has been proved that quantitative results can be obtained especially as regards to property returns.

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Methodology

The study applied relevant indicators using survey research design on past returns of commercial property investments arranged on a time series to obtain estimates of future values. Both quantitative and qualitative data were collected with the aid of questionnaire administered to registered Estate surveyors Valuers. To ensure a satisfactory degree of representation and unbiased view, the random and systematic probabilistic sampling techniques were adopted these techniques provided every estate surveyor and valuer in the study area the chance to be considered in the conduct of the survey.

The regression equation is given as

$y = a + bx$

Where; $a = y\ bx$

$b =$

And $r\frac{sy}{sx\ r}$ = correlation coefficient

$sy = standrad\ Deviation\ of\ y$

$sx = standrad\ \ Deviation\ of\ x$

5.0 The Analysis and Presentation of Data

Table 1 Regression Equation of Average Rental Return of 3 Bedroom and office

Accommodation in the study area from 2018-2022

SN/	**Year**	**3-bedroom**	**income Return**	$x\ x$	$y\ y$	(−	(	(
x		**Accommodation**	**y**					
1.	2018	600,000	6.0	-2	-0.02	0.04.	4.	0.0004.
2.	2019	570,000	5.8	-3	-0.22	0.22	1	0.0484
3.	2020	700,000	5.8	0	-0.22	0	0	0.0484
4.	2021	750,000	6.1	1	0.08	-0.08	1	0.0064
5.	2022	800,000	6.4	2	0.38	0.76	2	0.1444
	∑ = 15		∑ =30.1 $y = 6.02$	∑ = 0	∑ = 0	∑ =0.94	∑ = 8	∑ =

Source: Authors field Analysis 2022

The result shows a decline in return in 2016 which was as a result of the reduction in demand for rental properties due to the negative impact of the global economic recession witness in 2018/2019

$\sum(x - x)(v - y)$

$\sum(x - x)(v - y)^2$

$\sqrt{8\ X\ 0.248}$

$\frac{0.94}{8\ X\ 0.248} = \frac{0.94}{1.984}$

$r = \frac{0.94}{1.41}\ 0.667$

$h = r\frac{sy}{sx}$

$sy = \frac{0.248}{1.541} = 0.223$

$sx = \sqrt{\frac{8}{5}} = 1.265$

$\therefore b = 0.667 \times \frac{0.223}{1.265}$

$b = 0.118$

$b = 0.1$

If $a = y - bx$

$\therefore a = 6.02 - 0.118$

$a = 6.02 - 0.354 = 5$

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Hence, from the foregoing the estimated return for the period 202-2025 will be as follow;

$y = a + bx$

2022 = 5.67 + 0.118(7) = 6.5

2023 = 5.67 + 0.118(8) = 6.6

2024 = 5.67 + 0.118(9) = 6.7

2025 = 5.67 + 0.118(10) = 6.9

2026 = 5.67 + 0.118(11) = 7.4

Here, the finding shows that property returns will increase over time at quite a reasonable level why hoping that all things will remain constant.

Conclusion

From all indication, it can be concluded that if time series is applied to real estate investment analysis, it will help to a large extent in predicting future trends of rental value returns in commercial property sector. The study also reveal the progress or retrogress made over the years. In addition, it will be efficient, reliable in making sectorial property investment on the basis of their return over time

Recommendation

The Nigerian Institution of Estate Surveyors and Valuers should as a matter of fact make serious effort towards coming up with efficient and dependable data bank of property returns

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